

**IN THE CLAIMS:**

1. (Currently Amended) A method for performing time and frequency SNR dependent weighting in speech recognition comprising the steps of:

for each speech frame  $t_s$  estimating the SNR to get time and frequency SNR information  $\eta_{t,f}[[;]]$

calculating the time and frequency weighting to get weighting coefficient  $\gamma_{t,f}$ , wherein  $\gamma_{t,f}$  is a function of  $\eta_{t,f}$ ;

using an inverse DCT matrix  $M^{-1}$  to transform a cepstral distance  $(o_t - \mu)$  associated with the speech frame  $t$ , to a spectral distance;

computing a weighted spectral distance by applying time and frequency weighting to the spectral distance employing a time-varying diagonal matrix  $G_t$  which represents the weighting coefficient  $\gamma_{t,f}$ ;

transforming the weighted spectral distance to a weighted cepstral distance employing a forward DCT matrix  $M$  performing the back-and-forth weighted time-varying DCT transformation matrix computation  $MG_tM^{-1}$  to get a transformation matrix  $T_t$ ;

providing the transformation matrix ~~computation~~  $T_t$  and the original MFCC feature  $o_t$  that contains the information about the SNR to a recognizer including the Viterbi decoding; and

performing weighted Viterbi recognition  $b_j(o_t)$ .

2. (Currently Amended) The method of claim 1 ~~claim 1~~ wherein

$$\gamma_{t,f} = \frac{\sqrt{\eta_{t,f}}}{1 + \sqrt{\eta_{t,f}}},$$

which guarantees that  $\gamma_{tf}$  is equal to 0 when  $\eta_{t,f}=0$  and  $\gamma_{t,f}$  approaches 1 when  $\eta_{t,f}$  is large.

3. (Currently Amended) A method for performing time and frequency SNR dependent weighting in speech recognition comprising the steps of:

for each time period  $t$ , estimating the SNR to get time and frequency SNR information  $\eta_{t,f}[:,:]$

calculating the time and frequency weighting to get weighting coefficient  $\gamma_{t,f}$ , wherein  $\gamma_{t,f}$  is a function of  $\eta_{t,f}$ ;

using an inverse DCT matrix  $M^{-1}$  to transform a cepstral distance  $(o_t - \mu)$  associated with the speech time period  $t$  to a spectral distance;

computing a weighted spectral distance by applying time and frequency weighting to the spectral distance employing a time-varying diagonal matrix  $G_t$  which represents the weighting coefficient  $\gamma_{t,f}$ ;

transforming the weighted spectral distance to a weighted cepstral distance employing a forward DCT matrix  $M$  performing the back and forth weighted time varying DCT transformation matrix computation  $MG_tM^{-1}$  to get a transformation matrix  $T_t$ ;

providing the transformation matrix ~~computation~~  $T_t$  and the original MFCC feature  $o_t$  that contains the information about the SNR to a recognizer including the Viterbi decoding; and

performing weighted Viterbi recognition  $b_j(o_t)$ .

4. (Currently Amended) The method of claim 3 wherein the said estimating the SNR to get time and frequency SNR information  $\eta_{t,f}$  step is a pronunciation probability estimation step.

5. (Currently Amended) The method of claim 3 wherein the said estimating the SNR to

get time and frequency SNR information  $\eta_{t,f}$  step is a transmission over a noisy communication channel reliability estimation.

6. (Original) The method of claim 3 wherein

$$\gamma_{t,f} = \frac{\sqrt{\eta_{t,f}}}{1 + \sqrt{\eta_{t,f}}},$$

which guarantees that  $\gamma_{t,f}$  is equal to 0 when  $\eta_{t,f}=0$  and  $\gamma_{t,f}$  approaches 1 when  $\eta_{t,f}$  is large.

7. (New) A method for performing time and frequency SNR dependent weighting in speech recognition comprising the steps of:

for each speech frame  $t$ , estimating SNR to get time and frequency SNR information  $\eta_{t,f}$ ;

calculating the time and frequency weighting to get weighting coefficient  $\gamma_{t,f}$ , wherein  $\gamma_{t,f}$  is a function of  $\eta_{t,f}$ ;

transforming a cepstral distance ( $o_t - \mu$ ) associated with the speech frame  $t$  to a spectral distance;

computing a weighted spectral distance by applying time and frequency weighting to the spectral distance employing a time-varying diagonal matrix that represents the weighting coefficient  $\gamma_{t,f}$ ;

transforming the weighted spectral distance to a weighted cepstral distance to get a transformation matrix  $T_t$ ;

providing the transformation matrix  $T_t$  and the original MFCC feature  $o_t$  that contains the information about the SNR to a recognizer that performs Viterbi decoding; and

performing weighted Viterbi recognition  $b_j(o_t)$ .

8. (New) The method of claim 7 wherein the estimating the SNR to get time and frequency SNR information  $\eta_{t,f}$  is a pronunciation probability estimation.

9. (New) The method of claim 7 wherein the estimating the SNR to get time and frequency SNR information  $\eta_{t,f}$  is a transmission over a noisy communication channel reliability estimation.